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PROVISIONAL SPECIFICATION.

An Improvement in the Manufacture of Beer.

We, HORACE TABBERER BROWN of No. 47 High Street, Burton-on-Trent in the County of Stafford, Brewer, GEORGE HARRIS MORRIS of Alexandra Road Burton-on-Trent in the County of Derby, Brewers' Chemist, and EDWARD RALPH MORITZ of No. 72, Chancery Lane in the County of Middlesex, Analytical Chemist, do hereby
5 declare the nature of this invention to be as follows:—

We have discovered that the worts produced by mashing malt contain a greater or less proportion of certain substances, chemically known as "amyloïns" which have the property of being unfermentable during the primary stage of wort fermentation, but of becoming slowly decomposed during the secondary fermentation which occurs
10 during the storage of beer in casks or other vessels. These "amyloïns" have also the property of becoming rapidly converted into maltose under the influence of malt diastase.

It is to the presence of these "amyloïns," while they are unfermented, that is in great measure due the palate-fulness of the beer, and afterwards it is to the
15 result of their fermentation that the "condition" or briskness of beer is in great measure due.

Our invention relates to a process whereby we can ensure the presence of amyloïns in beers in such proportions as may be most suitable to obtain the required degrees of palate-fulness, and "condition" or briskness.

20 For this purpose, on ascertaining by suitable tests whether the amyloïns in wort are deficient or whether they are present in excess, we add them in sufficient quantity in the former case, and in the latter case we eliminate them (by adding malt diastase sufficient to convert them into maltose) then we restore to the worts thus treated, the required quantity of amyloïns.

25 In some cases we add amyloïns to the beer after the primary fermentation, either alone or along with such brewing sugars as are often added and with or without cold water malt extract according as to whether a rapid or a slow secondary fermentation ("condition") is desired.

30 The amyloïns above referred to are products obtainable at a stage of the ordinary treatment of starch for producing glucose.

Thus, if starch, water, and sulphuric acid in the proportion of about 100 parts by weight of starch, 300 parts of water and 3 parts of sulphuric acid, are boiled and agitated, a reaction takes place which produces mostly amyloïns after a time which can be determined by testing samples of the product. Thus, when the product is
35 found to have a specific rotatory power of about 193° , and a copper-oxide reducing power of about 21, the cold sample giving at the same time, a full red coloration with iodine solution, the reaction should be stopped by discontinuing the boiling and by neutralizing the acid.

40 The product should be filtered and more or less concentrated by evaporation as in the manufacture of ordinary brewing sugars.

Dated this 26th day of November 1889.

ABEL & IMRAY,
Agents for the Applicants.

COMPLETE SPECIFICATION.

An Improvement in the Manufacture of Beer.

We, HORACE TABBERER BROWN of No. 47 High Street, Burton-on-Trent in the County of Stafford, Brewer, GEORGE HARRIS MORRIS of 121 Alexandra Road, Burton-on-Trent in the County of Derby, Brewers' Chemist, and EDWARD RALPH MORITZ of No. 72 Chancery Lane in the County of Middlesex, Analytical Chemist, do hereby declare the nature of this invention and in what manner the same is to be performed to be particularly described and ascertained in and by the following statement :—

We have discovered that the worts produced by mashing malt contain a greater or less proportion of certain substances, chemically known as "amyloïns" which have the property of being unfermentable during the primary stage of wort fermentation, but of becoming slowly decomposed during the secondary fermentation which occurs during the storage of beer in casks or other vessels. These amyloïns have also the property of becoming rapidly converted into maltose under the influence of malt diastase.

It is to the presence of these amyloïns while they are unfermented, that is in great measure due the palate-fulness of the beer, and afterwards it is to the result of their fermentation that the "condition" or briskness of beer is in great measure due.

Our invention relates to a process whereby we can ensure the presence of amyloïns in beers in such proportions as may be most suitable to obtain the required degrees of palate-fulness and "condition" or briskness.

For this purpose, on ascertaining by suitable tests whether the amyloïns in wort are deficient or whether they are present in excess, we add them in sufficient quantity in the former case, and in the latter case we eliminate them (by adding malt diastase sufficient to convert them into maltose) then we restore to the worts thus treated, the required quantity of amyloïns.

Various means of testing the quantity of amyloïns present may be employed. The method of testing published in the Journal of the Society of Chemical Industry for 1890 page 533—535 may generally suffice to indicate whether and to what extent the amyloïns are in excess or deficient. We find practically that when the amyloïns amount to from 12 to 20 *per cent.* of the solid matter of the wort before fermentation, the beer will have the requisite amount to ensure the qualities desired.

As however special classes of beer may require or demand special and greatly varying proportions of amyloïns we do not necessarily confine ourselves to the above proportions.

In some cases we add amyloïns to the beer after the primary fermentation, either alone or along with such brewing sugars as are often added and with or without cold-water-malt-extract according as to whether a rapid or a slow secondary fermentation ("condition") is desired.

The amyloïns above referred to are products obtainable at a stage of the ordinary treatment of starch for producing glucose.

Thus if starch, water and sulphuric acid in the proportion of about 100 parts by weight of starch, 300 parts of water, and 3 parts of sulphuric acid, are boiled and agitated, a reaction takes place which produces mostly amyloïns after a time which can be determined by testing samples of the product. Thus, when the product is found to have a specific rotatory power of about 193°, and a copper oxide reducing power of about 21, the cold sample giving at the same time, a full red coloration with iodine solution, the reaction should be stopped by discontinuing the boiling and by neutralizing the acid.

The product should be filtered and more or less concentrated by evaporation as in the manufacture of ordinary brewing sugars. By varying the proportions of the materials and the conditions as to time or temperature under which the reaction is carried on, various amyloïns may be produced suitable for various qualities of beer,

Brown, Morris, & Moritz's Improvement in the Manufacture of Beer.

these amyloïns having various degrees of copper oxide reducing power and various polarimetric values, according to the varied proportions of maltose and dextrin of which they are compounded.

Having now particularly described and ascertained the nature of this invention and in what manner the same is to be performed, we declare that what we claim is :—

The herein described process for giving beers their proper qualities of palateness and condition by securing the presence in them of the proper quantities of amyloïns.

10 Dated this 14th day of August 1890.

ABEL & IMRAY,
Agents for the Applicants.